A RADIAL COMPLIANCE OF A COMPRESSOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to a radial compliance of a compressor, especially to the compressor functions to automatically leak pressure while it is in error running, such as an abnormal pressure generated in compressing rooms by oil or solid else, and lubricate while it is started initially for decreasing abrasion.

2. Description of the Prior Art

Normally scroll members of a compressor are consisted of a fixed one, called fixed scroll member, and another one moving around the fixed one relatively, called orbiting scroll member. Volume and pressure of flow of compressing rooms formed by the two scroll members are changing while the orbiting scroll member being in a round motion comparative to the fixed scroll member. Between the two scroll members existing three direction-forces is the most factor to affect features of the round motion. In case of worse running being caused, components or the two scroll members in the compressor may be damaged.

Besides, components shall be lubricated for normal operation while running, and further, the compressor needs some more lubricant for smoothly starting up in the period of initial working.

SUMMARY OF THE INVENTION

The main objective of the present invention is to offer a radial compliance of a compressor to have a function of protection while compressing rooms causing problems. The radial compliance is configured to make compressing rooms automatically leak at the time of abnormal pressure variation for avoiding components damaged.

The second objective of the present invention is to offer a radial compliance of a compressor to have a method of instant oil supplying. Oil may be splashed out from a space of storing oil of relative motion components immediately for lubricant in advance by way of centrifugal force and inertia while the compressor being started initially.

The third objective of the present invention is to offer a radial compliance of a compressor to have a method of instant oil supplying. Oil may be splashed out from a space of storing oil of fixed components for lubricant in advance by ways of circular motion between

relative motion components and the fixed components and stirring.

Other and further features, advantages and benefits of the invention will become apparent in the following description taken in conjunction with the following drawings. It is to be understood that the foregoing general description and following detailed description are exemplary and explanatory but are not to be restrictive of the invention. The accompanying drawings are incorporated in and constitute a part of this application and, together with the description, serve to explain the principles of the invention in general terms. Like numerals refer to like parts throughout the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects, spirits and advantages of the preferred embodiments of the present invention will be readily understood by the accompanying drawings and detailed descriptions, wherein:

Fig. 1 is a sectional sketch of the present invention.

Fig. 2 is a sketch of an assembly way of a transmission shaft and a transmission component of a first embodiment of a radial compliance of the present invention.

Fig. 3A and Fig. 3B are a first and a second sketches of an assembly way of a transmission shaft and a transmission component of a second embodiment of a radial compliance of the present invention.

Fig. 3C, Fig. 3D and Fig. 3E are a third, a fourth and a fifth sketches of an assembly way of a transmission shaft and a transmission component of a second embodiment of a radial compliance of the present invention.

Fig. 4 is a sketch of an assembly way of a transmission shaft and a transmission component of a third embodiment of a radial compliance of the present invention.

Fig. 5 is a sketch of another position of a space for storing oil of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Fig. 1 and Fig. 2, which are a sectional sketch of the present and a sketch of an assembly way of a transmission shaft and a transmission component of a first embodiment of a radial compliance of the present invention. There are some relative motion components

functioning compression in the compressing of the present invention, which comprises at least one transmission shaft 1, an orbiting scroll member 2 driven by the transmission shaft 1 and a fixed scroll member 3 meshing with the orbiting scroll member 2 for composing plural compressing rooms 4. The compressing rooms 4 moves as revolution by way of the transmission shaft 1 driving the orbiting scroll member 2 for compression; besides, a transmission member 5 between the transmission shaft 1 and the orbiting scroll member 2 is to let the transmission shaft 1 and the orbiting scroll member 2 be eccentric. Thus, a gap 11 is exist between the transmission member 5 and the transmission shaft 1 as well, and the gap 11 is the space for evading of the orbiting scroll member 2 and the transmission member 5 while an abnormal operation, such as an abnormal pressure generated in compressing rooms by oil or solid else, caused by the orbiting scroll member 2 and the fixed scroll member 3, that is, an action of automatically leaking pressure is made for avoiding components damaged.

An oil-storing space 6 is configured on at least one relative component of an upper portion of the compressor. The oil-storing 6 normally stores some oil 61 before starting compressor. By the time the first stage of starting, the oil 61 is automatically splashed out via eccentric force and inertia to lubricate in advance.

The aforesaid embodiment is to let the transmission shaft 1 and the transmission member 5 simultaneously run in a same direction. The structure of the embodiment is to configure two troughs 12, 52 on a combination location of the transmission shaft 1 and the transmission member 5. A pin 51 being conjunct with the two troughs 12 and 52 is to connect the transmission shaft 1 and the transmission member 5 for working together. Such that, the transmission shaft 1 is capable of driving the transmission member 5 to further force the orbiting scroll member 2 for revolution.

Referring to Fig. 3A and Fig. 3B, which are a first and a second sketches of an assembly way of a transmission shaft and a transmission component of a second embodiment of a radial compliance of the present invention. As shown in the two figures, the two troughs 12 and 52 are capable of configuring to penetrate through two side surfaces of the transmission shaft 1 and the transmission member 5; wherein the pin 51 is then inserted in. By means of the troughs 12 and 52 and the pin 51, the transmission shaft 1 matches with the pin 51 and further drives the orbiting scroll member 2 for revolution.

Additionally, to set an outer frame 54 or two buckles (not shown in figures) on two sides of the pin 51 is the way to prevent the pin sliding out.

Referring to Fig. 3C, Fig. 3D and Fig. 3E, which are a third, a fourth and a fifth sketches of an assembly way of a transmission shaft and a transmission component of a second embodiment of a radial compliance of the present invention. The pin 51 actually can be with the

transmission member 5 in one body, and the trough 12 is on a top of the transmission shaft 1, that is, the trough 12 cooperates with the pin 51 to make the purpose of the transmission shaft 1 driving the transmission member 5 and further to the orbiting scroll member 2. In Fig. 3D, the pin 51 also can be with the transmission shaft 1 in one body, and the trough 52 is on a bottom of the transmission member 5, that is, the trough 52 cooperates with the pin 51 to make the purpose of the transmission shaft 1 driving the transmission member 5 and further to the orbiting scroll member 2. In Fig. 3E, the trough 52 penetrates the transmission member 5, and the pin 51 is still with the transmission shaft in one body. The height of the pin 51 is longer than the depth of the trough 52, thus a penetrating phenomenon is configured while the pin 51 matching with the trough 52. Namely, the pin 51 functions to transfer force to force the transmission member 5 and further to the orbiting scroll member 2.

Referring to Fig. 4, which is a sketch of an assembly way of a transmission shaft and a transmission component of a third embodiment of a radial compliance of the present invention. A plane 13 on the transmission shaft 1 and a plane 53 on the transmission member 5 are cooperated with each other for the transmission shaft 1 driving the transmission member 5 and further to the orbiting scroll member 2.

Again, referring to Fig. 1, the oil-storing space 6 on the transmission member 5 can be rearranged on at least one suitable component of the upper portion of the compressor. By the time the first stage of starting, the oil 61 is automatically splashed out via eccentric force and inertia to lubricate in advance. The relative components to finish the lubrication include the transmission shaft 1, the transmission member 5 and an upper balancing member 7 fastened on the transmission shaft 1. The upper balancing member 7 can also be with the transmission shaft 1 or the transmission member 5 in one body, but not shown in the figure. The oil-storing space 6 is able to be configured on a top of the transmission member 5, the upper balancing member 7 or the transmission shaft 1; furthermore, the oil-storing space 6 may be better for being not concentric to the transmission shaft 1.

By the time the first stage of starting, the oil 61 is automatically splashed out via eccentric force and inertia to lubricate in advance. After the compressor being revolved, the oil 61 is pumped from a tank (not shown in the figure) of a bottom of the compressor up to the oil-storing space 6 for next starting and revolution.

Referring to Fig. 5, which is a sketch of another position of a space for storing oil of the present invention. The oil-storing space 6 is not only set on aforesaid components, but also other positioning components on the upper portion of the compressor, such as a bearing base 8, the fixed scroll member 3, a brace or other positioning components adjacent to aforesaid components. Taking the bearing base 8 as an example, the oil-storing space 6 is normally exist

on two suitable places of adjacent surfaces of the bearing base 8 and the upper balancing member 7; further, there is a stirring member 71 extended into the oil-storing space 6 on the adjacent surfaces of the bearing base 8 and the upper balancing member 7. In the first stage of starting compressor, the stirring member 71 mixes the oil 61 in the oil-storing space 6 by way of the circulation motion of the upper balancing member 7 for lubrication beforehand.

Although this invention has been disclosed and illustrated with reference to particular embodiments, the principles involved are susceptible for use in numerous other embodiments that will be apparent to persons skilled in the art. This invention is, therefore, to be limited only as indicated by the scope of the appended claims.